

REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application.

Claims 1-13 are now present in this application. Claims 1, 7 and 13 are independent.

Amendments have been made to the specification and claim 13 has been added. No new matter is involved. Reconsideration of this application, as amended, is respectfully requested.

Priority Under 35 U.S.C. § 119

Applicants thank the Examiner for acknowledging Applicants' claim for foreign priority under 35 U.S.C. § 119, and receipt of the certified priority document.

Restriction Requirement

The Examiner has withdrawn claims 7-12 from further consideration. The office Action states Applicants' options regarding a final rejection. However, the outstanding Office Action is not a final Office Action, so the meaning of these options at this stage of the proceeding is not clear.

Applicants continue to traverse the restriction requirement and argue that it is improper for a number of reasons.

Firstly, the Office Action completely fails to address Applicant's extensive arguments presented on pages 2-4 of the Response to Restriction Requirement filed on October 28, 2005, thereby violating the explicit requirements of MPEP Sections 821.01 and 707.07(f) to address the merits of Applicants' arguments. Because of this failure to address Applicants' extensive arguments traversing the restriction requirement, the restriction requirement must be withdrawn, prosecution reopened, and claims 7-12 examined on their merits.

Secondly, the Examiner failed to demonstrate that inventions I and II are distinct because the product, *as claimed*, recites, among other features (1) a buffer layer plated on the copper foil pattern; and (2) a tin layer plated on the barrier layer. The Examiner does not provide any objective factual evidence that the allegedly materially different process forms a barrier layer *plated* on a copper foil pattern and a tin layer *plated* on a barrier layer. All that the Examiner's allegedly materially different process achieves is a "spray coated" tin material on a barrier material, and a sputter coated barrier material on a copper material. This is not the claimed invention. Furthermore, a "transfer of a decalcomania" is not a materially different product than what is recited in claim 1. It is just another name for using what is recited in claim 1. Thus, the process, as claimed, has not been demonstrated to be used to make a different product than

what is claimed.

Accordingly, the restriction requirement is improper and should be withdrawn, and prosecution reopened and claims 7-12 should be examined on their merits.

Objection to the Drawings

The Examiner has objected to the drawings because (1) numeral 75 is used as a label for both a barrier layer and a plurality of pores, and (2) numeral 12, shown in Fig. 1, is not discussed in the specification. Applicant respectfully submits that the pores mentioned in the specification and recited in the claims are clearly shown in Fig. 3.

In order to overcome objection (1), the specification has been amended to delete "75" to label "pores", and in order to overcome objection (2), the specification has been amended to describe the portion of Fig. 1 that is labeled as "12."

Accordingly, reconsideration and withdrawal of this objection are respectfully requested.

Specification Objection

The Examiner has objected to the specification because of an obvious typographical error. In order to overcome this objection, Applicants have amended the specification in order to correct the deficiency pointed out by the Examiner. Applicants have also amended the specification to consistently label the tin-copper alloy layer with numeral 73. Reconsideration and withdrawal of this objection are respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 1 and 4-6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U. S. Patent 5,192,835 to Bull et al. ("Bull"). This rejection is respectfully traversed.

A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

Applicant respectfully points out that Bull fails to disclose any of the combination of features recited in claim 1. Bull does not disclose a "tape", as recited. Instead, Bull disclosed a "flip-chip" device. Also, Bull's terminal board 12 is not an insulation "film", as recited; Bull's terminal bumps 20 are not disclosed as a "copper foil pattern" nor are terminal bumps disclosed as being formed on a film, because a terminal "board" is not a film; Bull's "gold layer"

(presumably amalgam layer 30, but not clearly stated as such) is not a “barrier layer”, as recited. In this regard, Applicants respectfully submit that a barrier layer prevents diffusion of metal species and ionic contaminants into the tape metallization and adhesion layers. Layer 30 in Bull is disclosed as a bonding layer (col. 3, lines 55 and 56), not a barrier layer. Furthermore, claim 1 recites a barrier layer plated on a copper foil, and Bull fails to disclose a barrier layer, a copper foil or that any of Bull’s elements are plated onto one another.

In other words, Bull does not disclose any claimed feature recited in claim 1.

The Office Action essentially admits this to a degree by stating that terminal bumps (2)) are “analogous to” the tin layer.

The Office Action then admits that Bull is silent about the barrier layer having a plurality of pores, or about barrier layer thickness and about the tin layer.

Instead of objective factual evidence of the existence of any of these features, the Office Action merely speculates that “one skill in the art would fabricate a barrier material with pores because it prevents diffusion and enhances the bonding between the copper layer and the tin layer.”

The Office Action further speculates that “one skill in the art would choose a desired thickness for each layer because it is a matter of design choice.”

Applicant submits that this rejection is fundamentally unsound fore a

number of reasons in addition to those set forth above.

(1) This rejection fails to indicate how Bull would have to be modified to disclose or suggest or render obvious the claimed invention, none of whose positively recited features are found in Bull's flip-chip device.

(2) This rejection fails to provide any reason for one of ordinary skill in the art to fundamentally redesign and reconfigure Bull's flip=chip device into a tape device with the missing claimed features.

(3) This rejection provides no objective factual evidence of any prior art disclosing the claimed "barrier layer plated on the copper foil pattern at the connecting area, and formed with a plurality of pores."

(4) Nor does the Office Action provide any objective factual evidence of prior art which teaches that a barrier material with pores prevents diffusion and enhances the bonding between the copper layer and the tin layer (neither of which is disclosed by Bull).

(5) The Office has not provided any objective factual evidence of motivation

To achieve the recited pore density of claim 4 (and does not even address this feature in the rejection) or of motivation to achieve the recited thicknesses in claims 5 and 6. Moreover, merely stating that the thicknesses recited in Figs. 5 and 6 are a matter of design choice does not address the issues of whether those thicknesses are obvious choices.

(6) Terminal bumps (2) of Bull do not constitute a barrier layer including a plurality of pores and/or a plurality of tin-copper alloys formed in the pores which the barrier layer of the present invention recites.

(7) Because Applicant's claimed barrier layer has a plurality of pores, the contact area between the electroless tin plating solution and the copper foil pattern and the plating time are reduced, and any open circuit fault caused by excessive substitution between the copper foil pattern and the electroless tin plating solution is prevented.

Accordingly, the office Action fails to make out a *prima facie* case of obviousness of the claimed invention recited in claims 1 and 4-6.

Reconsideration and withdrawal of this rejection is respectfully requested.

Allowable Subject Matter

The Examiner states that claims 2 and 3 would be allowable if rewritten in independent form.

Applicant thanks the Examiner for the early indication of allowable subject matter in this application.

Applicant thanks the Examiner for the early indication of allowable subject matter in this application. Claim 2 depends from independent claim 1, and claim 3 depends from claim 2 and are therefore allowable based on their dependence from claim 1 which is believed to be allowable. Accordingly, claims

2 and 3 have not been rewritten in independent form.

Claim 13

Claim 13 has been added for the Examiner's consideration. Applicants submit that claim 13 contains all of the features of claim 1 along with an additional feature, a solder resist, and is therefore allowable because claim 1 is allowable, for reasons stated above.

Consideration and allowance of claims 1-13 are respectfully requested.

Additional Cited References

Because the remaining references cited by the Examiner have not been utilized to reject the claims, but have merely been cited to show the state of the art, no comment need be made with respect thereto.

Conclusion

All of the stated grounds of restriction and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding restrictions and rejections and that they be withdrawn, and claims 1-13 be examined on their merits and allowed. It is believed that a full and complete response has been

made to the outstanding Office Action, and as such, the present application is in condition for allowance.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicants respectfully petition for a one (1) month extension of time for filing a reply in connection with the present application, and the required fee of \$120.00 is attached hereto.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Robert J. Webster, Registration No. 47,472, at (703) 205-8000, in the Washington, D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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